Type 119 Control Valve

Introduction

Scope of the Manual

This instruction manual provides installation, spring adjustment, maintenance, and parts information for the Type 119 control valve.

Description

The Type 119 control valve (Figure 1) is used for on-off or throttling control of noncorrosive or mildly corrosive liquids and gases. It is designed to meet the low-pressure liquid and gas application requirements in many varied industries.

As loading pressure is applied to the Type 119 control valve diaphragm, the disk holder is pulled off the orifice. As loading pressure is reduced, the opposing spring force moves the disk holder toward the closed position, resulting in spring-close action should a loss of supply pressure occur.

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Figure 1. *Type 119 Control Valve*

Specifications

The Specifications table lists the specifications for the Type 119 control valve. Some of the specifications for a given control valve as it originally comes from the factory are stamped on a nameplate (Figure 2) located on the spring case flange.

Installation

WARNING

To avoid personal injury or property damage caused by controlled process fluid or bursting of pressure-retaining parts, be certain the service conditions do not exceed the limits shown in Specifications section. The leak-off and spring case vents must be kept open. To avoid danger of fire or explosion from venting of flammable or otherwise hazardous fluid into a closed or poorly vented location, pipe the vents to a well-ventilated location, away from any buildings or windows so as not to create a further hazard.

1. Before installing the valve, be sure the valve body and associated equipment are free of damage and foreign material.
2. The control valve can be installed in any position, but the normal orientation is with the actuator

Specifications

Maximum Inlet Pressure(1)
150 psig (10,3 bar)

Spring Ranges
See Table 1

Maximum Control Pressure to Diaphragm
150 psig (10,3 bar)

Maximum Pressure Drop(1)
150 psi (10,3 bar) for all port diameter

Temperature Capabilities(1)
With Nitrile (NBR) Elastomers:
-20° to 180°F (-29° to 82°C)
With Fluorocarbon (FKM):
0° to 250°F (-18° to 121°C)
Note: Not for use with hot water or ammonia.

Flow Direction
Up through the seat ring

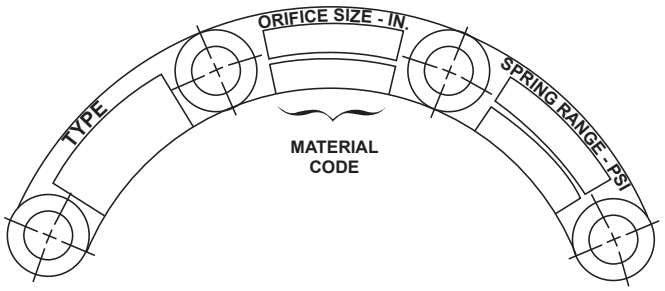
Spring Case Vent and Bonnet Leak-Off Connection
1/4 NPT internal

Approximate Weight
6 pounds (3 kg)

1. The pressure and temperature limitations in this Instruction Manual, and any applicable code limitation, should not be exceeded.

Table 1. *Spring Selection*

SPRING RANGE		SPRING PART NUMBER	SPRING COLOR CODE	SPRING WIRE DIAMETER, INCHES (mm)	SPRING FREE LENGTH, INCHES (mm)
Psig	bar				
3 to 15	0,21 to 1,0	1D892327022	Red	0.168 (4,27)	2.94 (74,7)
5 to 20	0,34 to 1,4	1D751527022	Unpainted	0.187 (4,75)	2.81 (71,4)
5 to 35	0,34 to 2,4	1D665927022	Blue	0.218 (5,54)	2.50 (63,5)
30 to 60	2,1 to 4,1	1D7455T0012	Green	0.234 (5,94)	2.57 (65,3)



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MATERIAL CODE	ORIFICE SEAT DISK MATERIAL
AI/N	Aluminum/Nitrile (NBR)
SST/N	Stainless steel/Nitrile (NBR)
SST/V	Stainless steel/Fluorocarbon (FKM)

Figure 2. *Type 119 Nameplate*

portion vertical above the body. If installing the control valve at an outside location, point the spring case and bonnet vents in the downward direction to protect them from moisture or foreign materials.

3. Install the valve using accepted piping practices. Make sure that the valve is oriented so that flow through the body will match the flow direction arrow on the body.

4. If continuous operation is required during maintenance and inspection, install a three-valve bypass around the control valve.

5. Connect the control pressure line to the 1/4 NPT connection in the valve body bonnet marked PILOT.

Spring Adjustment

The control valve spring has been selected to meet the pressure condition requirements of the application as specified on the order. This pressure condition is stamped on the actuator nameplate.

The spring has a fixed pressure span over which loading pressure will stroke the valve. Adjustment of the spring compression shifts the span so that more or less loading pressure is required to start travel. Since the span does not change, there will be a corresponding increase or decrease in the pressure requirements at the end of the valve stroke.

If the control valve has been disassembled or pressure conditions have changed, the spring may need adjustment to make the valve travel coincide with the diaphragm pressure range. Make the adjustment in the following manner. Key numbers refer to Figure 3.

1. Loosen the locknut (key 13) on the spring case.

2. Turn the adjusting screw (key 12) clockwise to compress the spring (key 16) or counterclockwise to decrease spring compression. Increased spring compression results in increased loading pressure necessary to start travel. Decreased spring compression results in less loading pressure required to start travel.

3. After adjustment, tighten the locknut. Note that the spring can be identified by the color code. Depending on how much conditions are changed, it may be necessary to install a new spring, using appropriate steps in the Maintenance section. After changing the spring, adjust the valve using the above steps in this section, and indicate the new spring range on the nameplate.

Maintenance

Valve parts are subject to normal wear and must be inspected and replaced as necessary. Inspection and maintenance depends on the severity of the service conditions.

WARNING

To avoid personal injury or property damage caused by sudden release of pressure or uncontrolled process fluid, isolate the control valve from the pressure system, and release all pressure from the valve body and actuator before performing maintenance operations.

The following describes the procedure for complete disassembly and assembly of the actuator-valve body combination. When inspection or repairs are required, disassemble only those parts necessary to accomplish the job. Key numbers refer to Figure 3.

Disassembly

1. Isolate the control valve from all pressure, and release pressure from the valve body and actuator. Loosen the locknut (key 13), and remove all spring compression from the control valve by turning the adjusting screw (key 12) out of the spring case.

2. Remove the two bonnet cap screws (key 15, not shown) that secure the bonnet to the body, and lift the spring case, bonnet, and trim assembly from the body.

3. Examine the seating edge of the orifice (key 3). If it is nicked or rough, unscrew it from the body with a thin wall 7/8-inch (22 mm) socket wrench, and replace it with a new seat ring of the proper size.

4. Remove the bonnet O-ring (key 11), and inspect it for wear damage.

5. Unscrew and remove the spring case cap screws (key 14). Remove the spring case, upper spring seat, and spring (keys 2, 17, and 16). Do not lose the nameplate (key 20) when removing the spring case.

6. Pull the hairpin clip (key 6) from the stem and remove the disk holder assembly (key 4).

7. Pull the diaphragm/stem assembly (key 5) out of the bonnet (key 9), and inspect for damage or deterioration. If necessary, replace the entire diaphragm assembly.

8. Without removing the O-rings and bushing spacers (keys 8 and 7) inspect their inside diameter surfaces for damage or deterioration.

Note

The following step should be performed only when there is an indication of O-ring or bushing spacer failure.

9. Remove the internal retaining rings, stem wipers, O-rings, and bushing spacers (keys 10, 19, 8 and 7). Inspect these parts for wear or deterioration, and replace if necessary.

Assembly

This procedure assumes that the control valve has been completely disassembled. If the control valve has been only partially disassembled, start these instructions at the appropriate step.

1. If the orifice (key 3) was removed during disassembly, lubricate the threads with Never-Seez[1] lubricant (key 21) or equivalent, and screw it into the valve body using a thin wall 7/8-inch (22 mm) socket wrench.

2. Lubricate the bushing spacers, O-rings, stem wipers, and internal retaining rings (keys 7, 8, 19, and 10) with Dow Corning[2] No.111 silicon-base lubricant (key 22) or equivalent, and install as shown in Figure 3.

3. Carefully slide the diaphragm assembly (key 5) into and through the O-rings and bushing cavity. Turn the diaphragm assembly to line up the diaphragm holes with the bonnet holes.

4. Slide the disk holder assembly (key 4) all the way into the stem. Connect the disk holder assembly with the hairpin clip (key 6).

5. Coat the bonnet O-ring (key 11) with Dow Corning No. 111 lubricant (key 22) or equivalent. Install the O-ring in the recessed notch in the bonnet (key 9).

6. Mount the bonnet (key 9) on the valve body (key 1), insert two cap screws (key 15, not shown), and tighten to 7 foot-pounds (9,5 N•m).

7. Put the spring (key 16) on the diaphragm assembly (key 5), and place the upper spring seat (key 17) in the end of the spring.

8. Lubricate the point and threads of the adjusting screw (key 12) with Never-Seez[1] lubricant (key 21) or equivalent.

9. Position the spring case (key 2) and nameplate (key 20) on the diaphragm assembly (key 5). Insert the cap screws (key 14).

10. Tighten all cap screws until finger tight. Then, following a crisscross pattern, tighten each cap screw.

11. Connect the control piping to the control connection in the bonnet.

12. Adjust the spring by following the procedures in the Spring Adjustment section, and remark the nameplate if necessary.

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2. Trademark of Dow Corning Corporation.

Parts Ordering

When contacting your local Sales Office for technical assistance or ordering replacement parts, include the type number and all other pertinent information stamped on the nameplate attached to the spring case.

When ordering replacement parts, also be sure to include the 11-character part number for each part required from the following parts list.

Parts List

Key	Description	Part Number
	Note	
	In this parts list, parts marked NACE can be used for sour gas service as detailed in the NACE International standard MR0175.	
	Part Kits	
	Kits include keys 4, 5, 6, 8, 10, 11, and 19.	
	For 1/8 (3,2 mm), 3/16 (4,8 mm), 1/4 (6,4 mm), 5/16 (7,9 mm), and 3/8-inch (9,5 mm) orifices with aluminum disk holder Nitrile (NBR) diaphragm, and Nitrile (NBR) disk and O-rings	R119X000A12
	For 1/2 (13 mm) and 9/16-inch (14 mm) orifices with aluminum disk holder, Nitrile (NBR) diaphragm, and Nitrile (NBR) disk and O-rings	R119X000A22
	For 1/8 (3,2 mm), 3/16 (4,8 mm), 1/4 (6,4 mm), 5/16 (7,9 mm), and 3/8-inch (9,5 mm) orifices with stainless steel disk holder, Nitrile (NBR) diaphragm and Nitrile (NBR) disk and O-rings	R119X00SN12
	For 1/2 (13 mm) and 9/16-inch (14 mm) orifices with stainless steel disk holder, Nitrile (NBR) diaphragm and Nitrile (NBR) disk and O-rings	R119X00SN22
	For 1/8 (3,2 mm), 3/16 (4,8 mm), 1/4 (6,4 mm), 5/16 (7,9 mm), and 3/8-inch (9,5 mm) orifices with stainless steel disk holder and Fluorocarbon (FKM) diaphragm, disk, and O-rings and stainless steel disk holder	R119X00SV12
	For 1/2 (13 mm) and 9/16-inch (14 mm) orifices with stainless steel disk holder and Fluorocarbon (FKM) diaphragm, disk and O-rings	R119X00SV22
	NACE Construction For 1/8 (3,2 mm), 3/16 (4,8 mm), 1/4 (6,4 mm), 5/16 (7,9 mm), and 3/8-inch (9,5 mm) orifices with aluminum disk holder, Fluorocarbon (FKM) diaphragm, disk and O-rings	R119XN0SV32
	For 1/2 (13 mm) and 9/16-inch (14 mm) orifices with aluminum disk holder, Fluorocarbon (FKM) diaphragm, disk and O-rings	R119XN0SV42
1	Valve Body	
	Cast Iron	
	NPS 3/4 (DN 20)	1E987119012
	NPS 1 (DN 25)	1E987319012
	NPS 1-1/4 (DN 32)	1E987519012
	Steel	
	NPS 3/4 (DN 20)	1E9871X0012
	NPS 1 (DN 25)	1E9873X0012
2	Spring Case	
	Aluminum	2P901508012
3*	Orifice	
	Aluminum	
	1/8-inch (3,2 mm) diameter	1A936709012
	3/16-inch (4,8 mm) diameter	00991209012
	1/4-inch (6,4 mm) diameter	0B042009012
	5/16-inch (7,9 mm) diameter	0B042109012
	3/8-inch (9,5 mm) diameter	0B042209012
	1/2-inch (13 mm) diameter	1A928809012
	9/16-inch (14 mm) diameter	1C4252X0012
	Stainless steel	
	1/8-inch (3,2 mm) diameter	1A936735032
	3/16-inch (4,8 mm) diameter	00991235032
	1/4-inch (6,4 mm) diameter	0B042035032
	5/16-inch (7,9 mm) diameter	0B042135032
	3/8-inch (9,5 mm) diameter	0B042235032
	1/2-inch (13 mm) diameter	1A928835032
	9/16-inch (14 mm) diameter	1C425235032

*Recommended Spare Parts

Key	Description	Part Number
4*	Disk Holder Assembly[1]	
	Aluminum/Nitrile (NBR)	
	1/8 (3,2 mm), 3/16 (4,8 mm), 1/4 (6,4 mm), 5/16 (7,9 mm) and 3/8-inch (9,5 mm) orifices	1A8328000N2
	1/2 and 9/16-inch (13 and 14 mm)	1C4248X0212
	Stainless steel/Fluorocarbon (FKM)	
	1/8 (3,2 mm), 3/16 (4,8 mm), 1/4 (6,4 mm), 5/16 (7,9 mm) and 3/8-inch (9,5 mm) orifices	1A8328000M2
	1/2 (13 mm) and 9/16-inch (14 mm) orifices	1C4248X0052
	NACE MR0175, Aluminum/Fluorocarbon (FKM)	
	1/8 (3,2 mm), 3/16 (4,8 mm), 1/4 (6,4 mm), 5/16 (7,9 mm) and 3/8-inch (9,5 mm) orifices	1A8328X0122
	1/2 (13 mm) and 9/16-inch (14 mm) orifices	1C4248X0182
5*	Diaphragm/Stem Assembly[1]	
	Aluminum/Nitrile (NBR)	17A8080X032
	Stainless steel/Nitrile (NBR)	17A8080X022
	Stainless steel/Fluorocarbon (FKM)	19A0348X012
	NACE MR0175, Aluminum/Fluorocarbon (FKM)	19A0348X022
6	Hair Pin Clip[1]	19A0347X012
7	Bushing Spacer, Delrin® 500 (2 required)	18A7021X012
8*	O-ring[1] (2 required)	
	Nitrile (NBR)	18A7019X012
	Fluorocarbon (FKM) (high-temperature, corrosion)	18A7019X022
	NACE MR0175, Fluorocarbon (FKM)	18A7019X022
9	Bonnet, aluminum	48A7025X012
10	Internal Retaining Ring[1] (2 required)	
	Nitrile (NBR) and Fluorocarbon (FKM)	18A7020X022
	NACE MR0175, Fluorocarbon (FKM)	18A7020X022

Key	Description	Part Number
11*	Bonnet O-Ring[1]	
	Nitrile (NBR)	1K594906562
	Fluorocarbon (FKM) (high-temperature, corrosion) and NACE MR0175	13A5559X012
12	Adjusting Screw, Zinc-plated steel	1D995448702
13	Locknut, Zinc-plated steel	1A353724122
14	Cap Screw, Zinc-plated steel (8 required)	1A391724052
15	Cap Screw, Zinc-plated steel (2 required) (not shown)	1B787724052
16	Actuator Spring, Zinc-plated steel	See Table 1
17	Upper Spring Seat, Zinc-plated steel	1D667125072
18	Type Y602-12 Vent (not shown)	27A5516X012
19	Stem Wiper[1],	
	Polytetraflouroethylene (PTFE) (2 required)	18A7024X012
20	Nameplate, Aluminum	1E542711992
21	Never-Seez Lubricant, 1 gallon (3,8 l) can (not furnished with valve)	1M523906992
22	Dow Corning 111 Lubricant, 10 pounds (5 kg) can (not furnished with valve)	1M528306992
23	Vent Screen, Stainless steel (not shown)	0L078343062
24	NACE Tag	19A6034X012
25	Tag Wire	1U7581X0022

*Recommended Spare Parts
1. Included in repair kit.
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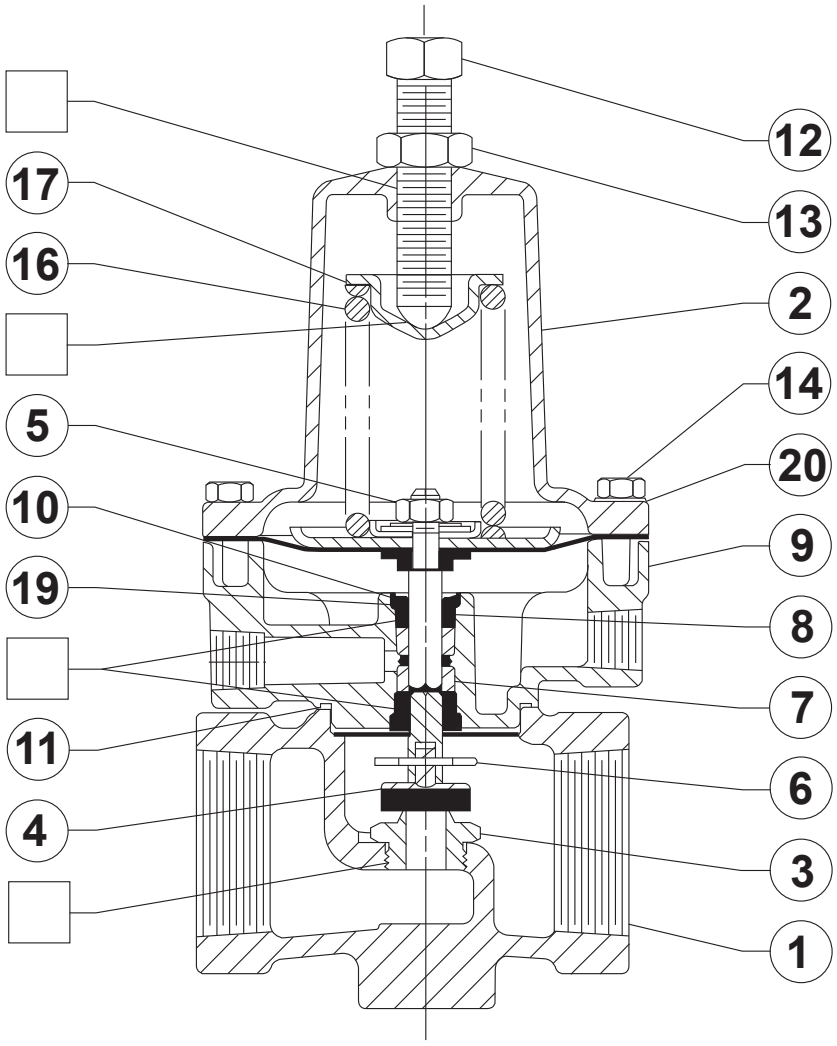

Figure 3. *Type 119 Control Valve Assembly*

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